

CASES

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OF

D I P H T H E R I A,

WITH SOME REMARKS ON THE

TREATMENT OF CROUP AND OF THE THROAT
AFFECTIONS IN SCARLATINA.

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CASES OF DIPHTHERIA.

DURING the last thirty years in which I have practised in this district, I have occasionally seen cases in which I have observed the throat inflamed, with lymph effused and adherent to a greater or less extent; but it has been only at a comparatively recent date that I have seen what I consider to be true cases of diphtheria, and I have known it to prevail epidemically here only since the commencement of the present year. This epidemic, too, has been as yet of a partial, and, in the great majority of the cases, of a comparatively mild character; so that I have had but limited opportunities of studying the disease. A practitioner, however, like myself, who has seen a good deal of the kindred diseases, scarlatina and croup, especially looking at the modifications which these affections sustain in successive seasons and epidemics, can, I have little doubt, at once apply many valuable lessons which he has learned from them to the treatment of the until lately comparatively rare disease, diphtheria.

The only epidemic disease I had known of immediately before the appearance of diphtheria was a mild form of remittent fever, lasting generally from a fortnight to three weeks, with occasionally a few cases having much of the character of typhus. Of the exanthemata, during the autumn and winter months of this season, I had seen almost nothing, and I have heard of only a very few cases of mild scarlatina. I have not, therefore, had any reason to conclude that the prevalence of the diphtheritic affection was in any way connected with, or dependent upon, the diffusion of the scarlatina poison. My patients affected with diphtheria have been mostly in the town of Falkirk, and within short distances east and west. North and south I have seen few cases, although the population, northwards especially, is considerable. One family, in an isolated and apparently remarkably healthy locality, suffered most. All the individuals living in the house, seven in number, were affected, and the two youngest were cut off. This house was kept scrupulously clean, but the rooms were small; and this circumstance often has seemed to me, where other sanitary conditions have been satis-

factory, the main cause of the spreading of contagious diseases. In several other families two, three, and four members were seized simultaneously, or in rapid succession.

A good number of the milder cases, I have no doubt, were passed over as attacks of influenza with inflamed throat, and really, until the number in a family taken ill, or the gravity of the affection, attracted attention, such appeared to be their character. I noticed, however, that many of this description were more persistent than attacks of influenza; and though no lymph could at first be detected on the throat, it yet, if watched for, was seen to appear in a few days. The approaches of the disease were remarkably insidious; in many cases, the throat, especially in children, being, I am persuaded, affected for some days before the case excited any uneasiness. Indeed, had it not been for the strong tendency which the disease showed to involve the air passages, a large majority of the patients seen by me would have been considered as in no danger whatever. And here I may remark, that perhaps the study of a not too severe type of a disease, although necessarily affording an incomplete view of all its phenomena, has some practical advantages, in so far as it enables us to apply and test the effects of remedies that otherwise would be useless. In *very* malignant examples of scarlatina or of cholera, for instance, we may say that any kind of treatment is of almost no avail. The patient from the first is struck down by a force against which the vital powers are utterly unable to contend. I have seen only one case of diphtheria in which the general system was so rapidly prostrated as quickly to place it beyond any hopes of successful treatment, and even it I was for some time in doubt whether I should class as diphtheritic at all.

As the case is interesting in several respects, I shall give a short account of it. The mother of this young man, eighteen years of age, had been attending occasionally for some days previous to the 7th of February, when he felt unwell, in a family where there was diphtheria; but her own house, in which her son lived, was in another locality, distant about a mile and a half, near which I am not aware that any diphtheria had shown itself. On 8th February I saw him, and thought the affection trifling, as any connexion with the cases of diphtheria his mother had been amongst did not strike me as likely. The throat was complained of very slightly. I examined it, but could see no lymph on it, and very little wrong with it, except perhaps a congested slightly swollen condition. There was also a little fulness externally at the angles of the jaws, the affection looking to me as not unlike the trifling attack called "mumps." I thought so lightly of the case, that on the 9th I did not see him. On the 10th, I found him much worse. The throat was not at all complained of; but the pulse had become quick, hard, and bounding; the breathing was oppressed, and there was considerable fever,—all seeming to me to indicate a commencing pneumonic attack. I immediately ordered an antimonial emetic, to be followed by a large

sinapism to the chest, and had the satisfaction of finding in the evening the breathing quite relieved, and the pulse quiet. On the 11th, the breathing and throat continued easy, but the nervous system had now become seriously affected. There had been constant raving during the night, which continued, with a tendency to coma, very like what we see in the more advanced stage of typhus fever. There was also on one cheek a defined red patch, something like what I had noticed on the lips of some diphtherial patients. On the 12th, the nervous symptoms continued, along with great general prostration and failure of the pulse. The head was shaved and a blister applied, and stimulants and support were given freely; but, in spite of all attempts to keep up the strength, he sank early on the morning of the 13th, being the sixth day from the commencement of his illness. At the time this case occurred, I entered it in my notes as being only of a suspicious character, from the strong resemblance it had to a case of diphtheria which I had under my care in the autumn of 1861. Subsequently, I was confirmed as to the correctness of my suspicions, from the occurrence of three other cases in the same house. The sister of this patient, who slept in the same bed as he had done, was seized, within ten days of his death, with inflamed throat and considerable general fever; and on 26th February, the mother, who appeared to have been the original medium of conveying the infection, was also taken ill, and suffered from a pretty severe and well-marked attack of diphtheria, the tonsils, uvula, and soft palate being all more or less covered with lymph. It commenced with feverishness and a full hard quick pulse, with some oppression in the breathing; and in these respects very much resembled the attacks of influenza with slight chest affection, of which most practitioners in this country, I imagine, have seen so much for a good many years past, and which, though of little moment, if promptly and vigorously treated at their commencement, if neglected, occasionally pass on to more serious inflammatory attacks. Immediately on seeing this patient, I prescribed an antimonial emetic, in which I have great confidence in such cases, and next day the breathing was quite relieved, but the pulse was 120, though soft. The other symptoms were attended to, as I shall have to mention immediately; but twelve to fourteen days elapsed before the patient was convalescent.

As a contrast to the severe and fatal case I have given, I will mention another, as an example of a class so apparently trifling that it attracts little or no attention, from friends or practitioners, until experience has taught both some severe lessons; and which places in our hands a stage of the disease anterior to the formidable laryngeal complications which are so apt to take place, and the occurrence of which we may be able to prevent, by anticipating the danger, and employing appropriate local and general remedies.

H. E., eight years old, had been complaining a little on the 27th March of the throat, but seemed otherwise well enough. In the

evening, however, she was hot and flushed, with a little oppression in the breathing, and a quick bounding pulse. Several other children in the same family having lately been affected in a similar way, the alarm was immediately taken,—the throat was touched with a strong solution of nitrate of silver (15 grains to the ounce of water), and an antimonial emetic was given. Next morning the breathing and pulse were quieted, but there was still some fever. The throat was considerably inflamed, and on the left tonsil there was a small piece of lymph. The throat was sponged with the caustic solution, and other means to control the inflammation used; and on the 29th this little girl felt easy, and the pulse was 88 and soft; in fact, to a superficial observer, she would have seemed all but convalescent. On examining her throat, however, I did not find this to be the case. It looked more angry and swollen, and the inflammation seemed more extended. Instead, therefore, of desisting from treatment, I considered it more necessary that, both generally and locally, this should be assiduously attended to. All night, no doubt, without this have gone on well enough, but had it not been done, we might also have seen in this insidious disease serious secondary complications,—a little huskiness in the evening, an attack of croup next morning, and death within a short time afterwards.

In point of fact, on the evening of the fifth day of this attack, a rough half-croupy cough did come on, which ceased shortly after the caustic solution had been dropped into the larynx. Next morning, after applying the sponge to the glottis, I noticed on it a very small piece of soft yellow lymph. Any one looking at this little girl, who was now moving about, and not noting these facts, would have thought any treatment altogether unnecessary, and any anxiety to be quickly rid of a dangerous enemy perfectly visionary. On the evening of the eighth day there was still a very little irritability in the beat of the pulse, which prescribed caution. On the morning of the ninth day the throat had almost a blanched appearance, and the mucus from the glottis on the sponge was perfectly natural.

In noticing the progress of this little epidemic, I shall have to mention some cases of the insidious and rapidly fatal kind I have alluded to. I shall first, however, state a few particulars of another case, in which the absence of general symptoms was very striking, when we take into account the serious nature of the throat affection which existed.

This girl, aged 13, was servant in a house close to where diphtheria first appeared, and, on 18th February, when I saw her, she had been removed to her own home, and stated to me that she had been ill for a week, and had been using gargles to the throat, and poultices externally. There was no fever, and the pulse was quite natural. The soft palate on the right side was of a dark red colour, and was much swollen, and there was a large patch of thick yellow

lymph on the tonsil of that side. The left side of the palate was also much inflamed, as well as the whole of the pharynx that could be brought into view, on the back of the left part of which was seen a smaller patch of yellow lymph. The case was immediately put under the treatment which I shall have to mention, and a gradual improvement began to take place. The pulse remained for some days unaffected, and never rose above first 84 and then 96. As the case advanced, and the lymph began to separate, the appearance presented by the throat reminded me much of some of the ugly, neglected superficial syphilitic throat affections which we sometimes see.

The pain, likewise, in most of the cases I saw was very trifling, and at the commencement especially this tended to throw those in attendance very much off their guard. In one instance, the inflammation extended up the Eustachian tubes, and the pain was then somewhat more acute.

The first death from diphtheria in this district which I heard of this season, took place on 14th January. It was a child five years old. I believe four other members of the same family were subsequently seized with the same disease, of whom one, an adult, died.

On 10th January, I saw a child thirteen months old, in the same locality, who had been a little feverish during the night, and whose voice was very slightly husky when it cried. I thought the irritation might proceed from teething, and I therefore scarified the gums, and also, by way of precaution, sponged the glottis with the solution of nit. argent., though on examination I could see little wrong with the throat. On the 11th, as the child seemed fully as easy as on the previous day, I contented myself with repeating the sponging. On the 13th, slight erupiness had commenced; on the 14th, it was decided and distressing; and on the 15th, the child died. In the same family, on the 13th, I was requested to see the servant girl, and found her throat much inflamed and coated with lymph. There was no fever, however, and I therefore contented myself with cauterizing and sponging the throat, which alone I would now certainly, with my additional experience, not consider safe practice. The girl, however, did well. On 4th February, in the same family, a twin-brother to the one who died, was seized with similar symptoms. This case I did not see, but I was informed by the father that he was cut off in less than twenty-four hours. Still further, on 28th February, a foster-child was seized with high fever, very quick full pulse, suffused eyes, inflamed throat, and husky voice. By this time I had become, from my more extended experience, thoroughly alive to the importance of checking the disease in its early stages, as well as to the necessity of using general as well as local measures. By the vigorous use of these the attack was checked in a few days. To the measures which I now employed in combating this affection I shall immediately advert; but it will first be instructive to give a little in detail the

complete history of a fatal case which occurred early in the epidemic. It took place in the family of seven I have already mentioned as having been attacked. At 4 P.M., on 3d February, I saw the first patient taken ill in this house,—an infant a few weeks old. I was told it had been somewhat restless during the day, but there was no fever, and the child did not seem in any way uneasy. There was, however, a little hoarseness when it cried, but I did not find the throat inflamed. I applied the sponge with the caustic solution to the throat and glottis, and ordered some warm salt to the throat externally,—a favourite application of mine in the early stages of eroup. On calling next forenoon, I was astonished to find that my little patient had died at one A.M., being only nine hours after I had seen it in no apparent danger. Alarmed by this unlooked for result, I thought it prudent to examine the throat of another little girl, eighteen months old, who however was apparently not in the least ailing, and here I found, to my surprise, decided evidence of the presence of diphtheria. Both tonsils were slightly coated with lymph, and the mucous membrane of the throat seemed to me to have a slightly granular look; but there was very little swelling, and the redness was by no means intense. The breathing and voice were perfectly natural; in fact, the child seemed quite well, and I dare say some of the attendants thought me rather officious when I took her under my care, and said she must on no account be neglected. I did not think, however, that any very active measures were called for; and therefore, on the 4th, 5th, 6th, and 7th, I contented myself with thoroughly sponging the throat, including the fauces and glottis, with the caustic solution, and with touching the lymph with the solid caustic. On the 8th, the lymph on the tonsils had increased. Still she was quite easy, though reported to be a little restless during the night. The child continued in nearly the same state, and the same treatment was applied up to the 10th, when very slight huskiness in the voice was noticed. When touching the throat and glottis with the caustic solution, portions of lymph, and a tenacious muco-purulent fluid, began to be coughed up in considerable quantity. Hot salt to the throat externally, an emetic of ipecacuanha wine, and a sinapism to the breast, were ordered, to be followed by four drops of the tinct. mur. ferri, three times daily. The throat at the same time was touched with caustic, and sponged as before. From the 10th to the 16th, the husky eroupiness several times became a little more severe, and was apparently controlled for a time by antimonial emetics given cautiously, by sinapisms, a blister to the throat, and the persevering use of the other means mentioned. All was of no avail however, for on the latter day my patient died; though, even on the 15th, when the child lay quiet, the breathing was pretty easy. Considerable relief always seemed to be felt when either the sponge or the emetics caused the muco-purulent fluid to be coughed up. On one occasion, two or three days before death occurred, a very dis-

tressing struggle for breath took place, until a quantity of this fluid was discharged. In the latter stage of this case the same kind of fluid also constantly flowed from the nares. I examined the body on the 17th. On opening the trachea immediately below the larynx, a large quantity of very purulent mucus burst out, as if it had come from an abscess. Both tonsils were covered with tenacious yellow lymph, so organized and adherent that it required some force to detach it. The epiglottis and membrane lining the fauces were pretty free from disease, and did not show indications of having been intensely inflamed. The lining membrane of the larynx was swollen, and was coated with soft, pulpy, jelly-looking lymph. A very thin semi-transparent false membrane extended into the trachea, reaching to about an inch and three quarters from the glottis. Below this the trachea was healthy, and the lungs were perfectly healthy and crepitant throughout.

Connected with this case we may note, *1st*, The insidious progress made by the disease. On the forenoon of the 4th, when I first examined the throat, not the slightest suspicion existed on the part of the friends that any thing was wrong with the child, and yet there can be little doubt, from the appearance of the lymph on the tonsils, that the throat must have been affected for some days. The slow and gradual affection of the larynx, too, is worthy of special attention in a practical point of view. It was not till the 10th, six days from the time I first examined the throat, that the least huskiness in the voice, when the child cried, could be observed. The breathing was also easy, and any feverishness which existed was quite trifling; nevertheless, the pathological changes had already begun in the larynx that were so rapidly to prove fatal, and the huskiness was the small black cloud which indicated that serious danger was now imminent. *2d*, All the other parts except the larynx were in a state that was quite compatible with the continuance of the vital functions. The inflammation and its effects that had existed in the throat, pharynx, and epiglottis had been rather superficial and obstinately persistent than destructive, and in this respect presented a remarkable contrast to what I have seen in neglected cases of scarlatina anginosa, and what I am aware is also reported to have taken place in severe or neglected cases of diphtheria. What struck me most, as compared with the scarlatina throat, or what I had ever seen before in almost any other affection, was the obstinacy with which the lymph on the tonsils resisted the daily application of the solid caustic, besides the use of the caustic solution, for eleven days. I had generally been accustomed previously to see a few free applications of the solid caustic cause the rapid separation and dissolution of effused lymph, but here, if dissolved at all, this was accomplished very partially, for after death, it had a consistence like what we find in a tolerably old adhesion. *3d*, It will be noticed that the lymph on the tonsils was yellow and tough, while that in the larynx was soft, and semi-transparent,

altogether less highly organized. In all probability the lymph in the larynx was effused at a later period than that on the tonsils, and while the patient was under active general and local treatment. Was the difference in the appearance and qualities of the two due to the treatment? Had the disease become controlled to a certain extent when the effusion in the larynx took place, though not so entirely as to prevent the production of this plastic substance, which looked to me like something between jelly and false membrane? I am inclined to think that this *was* the case, for I noticed in other instances, to which I shall have to refer, that the lymph first effused on the throat before the treatment had begun was yellow and tenacious; then that the next, while the patient was under treatment, was semi-transparent and soft; and afterwards that only a jelly-looking mucus was produced. If this explanation be correct, it becomes a matter of vast importance that the curative measures should be such as will, with the least possible delay, bring the parts into that condition in which only the jelly-like mucus will be produced. 4th, Another thing that struck me in the case I have detailed was this, that the appearance of the throat and fauces as to inflammation, in spite of all the assiduous local and general treatment employed, remained very much the same from the 4th to the 15th. It never was intense, and it did not increase, but still it persisted, and remained nearly stationary, keeping me constantly uneasy, from the fear of its extension to the air passages. It seemed to me that I was contending with a specific disease,—such, let me say, as erysipelas, scrofulous ophthalmia, or syphilis; that I had a constitutional tendency or poisoning operating against me, and that I had not as yet employed those remedies that would enable me to control effectually the inflamed throat in this affection. To this important point I now therefore directed my attention, and I am satisfied that, in such cases as I saw, unless the inflammation be effectually controlled, all other treatment will be comparatively futile. Too much attention, I think, in looking at the literature of diphtheria, has been bestowed on the products or consequences of the inflammation. Writers seem to me to have been more anxious to get rid of the effused lymph than to combat the peculiar inflammation which caused that lymph to be effused,—to find remedies for ulcers, rather than to prevent these occurring. In the present case, what should I have gained if, by applying escharotics, I had destroyed the lymph on the tonsils, unless at the same time I had subdued the accompanying inflammation? On the other hand, if we can by any means control or remove the latter, the former will either not be produced, or will quickly and easily disappear.

I have said that it appears to me that we have in diphtheria not merely an inflammation, but one of a peculiar and specific kind, produced by certain morbid influences which are operating on the system; and the error I committed in the treatment of the case narrated, consisted, I think, in trusting too much, during the first

six days, to merely local remedies. I do not in the least undervalue the local treatment employed; on the contrary, I think it was most valuable; but I cannot at the same time, with the experience I now have of the disease, repeat in language too strong or emphatic my conviction, that those six days in which the patient was free from all urgent symptoms were precious, especially in so far as they afforded sufficient time in which the constitutional element of this affection might have been combated and controlled. On the 10th, after the emetic had been given, tinct. mur. ferri was begun; but I am afraid this medicine had but scanty justice done to it, from the inflammation having then attacked the larynx, and from the more urgent effects which thus resulted requiring the exhibition of the tartrate of antimony as an emetic, as well as in smaller doses to keep down the pulse.

In two papers which were published in the *Edinburgh Medical Journals* (one of them nearly thirty years since),¹ I expressed my opinion as to the very great importance of beginning the treatment of the throat in scarlatina, and of croup, at the earliest possible period. That opinion has been only strengthened by all I have subsequently seen of these diseases; and now in regard to diphtheria, which is undoubtedly different from either of these, and yet in some respects seems like a combination of both, I may say that my conviction is equally strong as to the vital importance of beginning its treatment, locally and constitutionally, at an early stage. Where it has made its appearance in a family, I would say that nothing should be taken for granted. Let the throat of every member of it be examined daily, and let the first appearance of inflammation or of lymph be regarded as sufficient evidence that treatment is required. With this precaution, I feel certain that a large proportion of what apparently are sudden seizures may be got under treatment some, and frequently many, days before dangerous symptoms show themselves, and that the occurrence of these may be anticipated and prevented, or at least their intensity greatly abated. To any one who has attended carefully to even the local treatment of the analogous throat and laryngeal affections in scarlatina anginosa and in croup, nothing, I think, can be more gratifying than to see the command which prompt, early-begun treatment has over these destructive affections. Out of many hundreds of scarlatina cases which I have had under my care, I can remember scarcely a case in which, if I saw it within the first twelve or even twenty-four hours from the appearance of the eruption, I was not able, simply by assiduously applying the solid caustic, or the solution, to the tonsils and surrounding parts, to keep these in a comparatively entire and healthy condition; and this even where the case was, from other causes, running on to a fatal issue. Without such treatment, I cannot doubt that in these instances the tonsils would often have been found after death, what most surgeons conversant with this

¹ See *Edinburgh Quarterly Medical Journal*, 1837; and *Monthly do.*, 1858.

disease must have seen them become when neglected, a pulpy sphacclated mass, with the marks of intense inflammation in the adjacent parts. In croup, also, I know of no treatment which is so satisfactory as the application of the caustic solution, provided it be made immediately on the appearance of the characteristic ringing cough. In the latter paper I have alluded to, I mentioned that I had repeatedly in my own family had occasion to employ this remedy; and I repeat now what I said then, that I have generally found the croupy cough and breathing to have either disappeared or to be greatly improved, within half an hour after one or two applications. Two conditions, however, seem to me essential to success; the first is, as I have said, that the application shall be made *very early*. How early it must be made, to secure a considerable measure of success, it is not easy to say, as cases differ much in the rapidity with which they advance; but my experience has taught me, that very generally, if the disease has lasted for only ten or twelve hours, the caustic solution produces, for every hour lost, less marked effects. Acting on this experience, I have for many years made the whalebone and sponge part of the furniture of my pocket-case, and the moment I am called to a patient with the slightest croupy cough or breathing, I improvise a solution with my solid caustic, and touch the glottis. The second condition necessary to secure success is, that not the throat merely (which I have never found much affected in real croup) should be sponged, but that the glottis should be touched, and that some drops should fall into the larynx. With a little practice and dexterity this is easily done, even in infants. That the solution has really got into the larynx, we are assured from noticing the interruption to breathing which takes place in consequence. A good many years since, to satisfy myself as to the precise bend and dimensions required in the whalebone, in order to strike the glottis in children with precision, I extracted the cervical vertebræ, and opened the pharynx from behind, when making a post-mortem examination of a girl five years old, who died of croup, and I found that the arm to which the sponge is fixed should be about $2\frac{1}{4}$ inches long, and the bend not quite that of a right angle. A firm piece of whalebone should be chosen; and, to prevent the sponge slipping off, I have two small holes drilled in the whalebone, and the sponge sewed on through these.¹

¹ Since the above was written, I have also used a simple little instrument for dropping the caustic solution into the larynx and trachea. It consists of a bit of india-rubber tube, of the smallest size, tied gently on the upper side of a firm piece of whalebone, having the proper curve. With this, a quarter of a drachm of fluid, or more if wished, may with the greatest ease be dropped over the glottis; and any one can easily satisfy himself by experiment that some of the fluid reaches the trachea. In using the instrument, I place the quantity of fluid wanted in a wine-glass, draw it up the tube with the mouth, compress the tube with the finger at the proximal extremity to prevent escape, and withdraw the pressure when the tube is over the glottis. In the continuation of this paper, I shall mention some of the cases in which it was used.

I interrupted the history of my experience in diphtheria to make these remarks, because I think they have an important bearing on the treatment of this disease also. I shall now resume my narrative.

During the thirteen days that the little girl, the history of whose case I last narrated, lay ill, I examined daily with great care the throats of five other persons who lived in the house,—viz., 1st, A girl, about 13 years of age, who used to keep the child; 2d, The servant girl; 3d, A young lady who was visiting the family; and, 4th and 5th, The father and mother. On 7th Feb., or four days after I had been called to see the infant, the mother complained a little of her throat, and, on examination, it was found somewhat inflamed, and the caustic solution was applied. In a day or two afterwards, the servant girl and the young lady also complained, and were similarly treated daily, as indeed were all my patients. On the 14th, the throats of all the five were inflamed, the inflammation having commenced in four of them as mere superficial patches, followed by the distinct diphtheritic effusion. On the 16th, the girl who kept the child, and who had gone to her own home, had the throat inflamed, but with no lymph on it. A patch of this, however, showed itself two or three days afterwards. She was feverish at this date, and an antimonial emetic was given, which apparently acted very beneficially in reducing the pulse and abating the fever. The others were perfectly free from fever; and the father, on the 15th, felt himself so well that, much against my advice, he ventured out to his regular duties. I had cauterized and sponged with the caustic solution their throats daily, and I had ordered to be taken, for three or four days, ten drops of the tinct. mur. fer. twice daily. Nevertheless, the inflammation of the throat and the effusion of lymph kept slowly but steadily advancing.

On this day, the 16th, my little patient died. Seeing no decided indications, in any of the cases, of having got the inflammation under effectual control by the treatment I had employed, I now commenced giving, as an alterative or constitutional medicine, the iodide of potassium, employing the same local applications as formerly, with emetics whenever croupiness made its appearance, or the pulse became quick, full, and vibrating. Where there was no fever, I gave a tablespoonful of the solution of the iod. pot. (3i. to water 3x.), three times daily to adults, and less in proportion to younger patients; but where the case was in the least urgent, I gave the same dose every three or four hours, and latterly even oftener; and from this time it seemed to me that I had got a certain and more decided amount of control over the disease. I had not seen this medicine mentioned by any writer on diphtheria as having been employed with success; but it struck me, from its well-attested constitutional efficacy in syphilis, rheumatism, the undermining ulcer of the cellular tissue, etc., that it would also be likely to be useful in this disease, and I had employed it in rather a severe

case of diphtheria three years previously, with apparently very satisfactory results. I confess, however, that up to this time I trusted, I think, too much to the use of merely local applications and antiphlogistics. In all the cases which came under my care afterwards this medicine was used.

To resume:—On the 17th, of the four patients who remained in the house the throats in three were decidedly less inflamed, and that of the fourth (Miss T.) a little less so also. Cont. iod. pot. Throat sponged and touched with caustic.

On the 18th, the throats of the first three were still improving, and the lymph was slowly separating. Miss T., however, was not so well. During the night her breathing had become croupy, and she had got an antimonial emetic, which had the effect of relieving this. Her pulse was now 96, and moderately full; the eyes were slightly suffused, and the throat, though a little less inflamed, was considerably more so now than any of the others. On the soft palate and back of the pharynx there were five small patches of lymph. Cont. u. a. iod. pot.; caustic solution to larynx.

On the 19th, Miss T.'s windpipe decidedly affected; voice husky and changed; throat, however, improving; pulse 96, and moderately soft; sinapism to neck. Iod. pot. every three hours. Throat sponged and touched u. a. To use inhaling mixture.¹

The other three patients free from fever and improving. Lymph had in several places now come off, and left a superficial raw sore. On the fauces of two of them there had been for a day or two some raw-looking patches. Cont. omnia u. a.

On the 20th, the girl who had gone to her own home got feverish and flushed; pulse 100, full, and somewhat hard; took an antimonial emetic, and was considerably better next day. The same measures were continued in her case as with the others, but she was not convalescent till about a fortnight from being first seized.

On the 21st, Miss T.'s pulse was 96, and soft; huskiness decided; throat nearly as yesterday; blistered surface very tender. Cont. omnia u. a.

22d.—Miss T. better; pulse 84, soft; quite easy, though voice still a little husky; thinks the inhaling has done good in removing the laryngeal affection.

Of the other three, my notes say, "that they are now all but convalescent, the smallest portion of lymph adhering in each throat. The throats have now even a blanched appearance, and this extends to mouth and tongue; for, though I have spoken principally of the throat, the tongue, mouth, and fauces have all been injected, and this is no doubt the reason why there has been so much tenacious mucus secreted. The tendency over the whole membrane affected seems to have been to throw out lymph, which, when in small

¹ The inhaling mixture given was one I have employed for many years, and was originally, I think, used by Dr Scudamore. Tinct. of iodine, iod. pot., and cicuta, are its active ingredients.

quantity, rendered the mucus tenacious and adhesive, or gave it a semipurulent appearance."

23*d.*—Miss T. now feels well; pulse 70, soft; hoarseness nearly gone; throat cleaner. Touched and sponged as before. The other three convalescent. Their throats have a remarkably blanched appearance.¹ All to continue iod. pot., night and morning, for a few days, and Miss T. to inhale.

Several other similar cases that had now come under my care, appearing to have been equally benefited by the treatment I have mentioned, I continued it with some confidence. If the patient when I was called was free from fever, but had the throat affected, I contented myself with touching the lymph with the caustic, and sponging the throat, fauces, and glottis with the same solution, and gave the sol. iod. pot. from three times daily to every two hours, according to the urgency of the case. Where there was any fever, with full, quick pulse, or hoarseness at the commencement, I always premised an antimonial emetic, which I usually prefer, unless the patient is very young; and I gave the same whenever, during the attack, hoarseness came on, or the pulse became full, quick, and what I would call threatening mischief. When there was the slightest hoarseness, I never failed also at once to drop the caustic solution into the windpipe.

A very few particulars of some of the other cases that occurred to me will, I think, be interesting.

*Feb. 22*d.**—Called at night to see an infant which was feverish, and had husky croupy breathing. There was slight erysipelas on arm, apparently from irritation of vaccination; throat inflamed. To have emetic; sponged throat and glottis; poultice to arm.

23*d.*—Still croupy, and nares red and discharging; throat red,

¹ This blanched appearance of the throat which I have very frequently noticed in my diphtheria patients, I have felt inclined to attribute to the treatment, and especially to the action of the iodide of potassium. To test this, I gave four children, free from disease (Nos. 1, 2, 3, and 4, and respectively five, eight, eleven, and twelve years of age), the same solution (3i. to 3x. of water) three times daily, half a tablespoonful to the youngest, a tablespoonful to the eldest, and three-fourths to the two others, with the following results:—Eighteen hours after taking it, the throats of Nos. 1 and 2 were slightly paler than at first; Nos. 3 and 4 were nearly the same as at first. Forty-two hours after taking it, Nos. 1 and 2 were nearly the same as at first; Nos. 3 and 4 were paler than at first. Sixty-six hours after taking it, Nos. 1, 2, 3, and 4 were all rather paler than at first. Seventy-three hours after taking it, all four had a blanched appearance. Ninety hours after taking it, all four were nearly as at first. One hundred and two hours after taking it, No. 1 was nearly as at first; Nos. 2, 3, and 4 were slightly blanched. One hundred and twenty-six hours after taking it, Nos. 1 and 4 were as at first; No. 2 paler than at first; No. 3 blanched. One hundred and fifty hours after taking it, and thirty-six hours after the iod. pot. had been intermitted, all were as at first. The data here are too limited to allow any very positive conclusion to be drawn, but, as far as the experiment goes, it would seem to indicate that this medicine does exert an influence, though a varying one, on the colour of the capillaries of the throat.

granular-looking. Sponged as before, and gave a teaspoonful of solution iod. pot. every fifth hour. In the evening, better;—throat sponged.

24th.—Quite well.

Shortly before this, another child in the same house was similarly seized, and treated with the sponging and an emetic, and was quite easy next day.

On 21st Feb., was called to Mrs F., who had been visiting a family where there was diphtheria, and who was feverish; pulse full and quick; throat inflamed. Emetic,—to touch throat with powdered alum.

22d.—Pulse 94, soft; throat inflamed; tonsils somewhat swollen, and their surface coated with transparent lymph. Touched lymph with caustic and sponged fauces. Sol. iod. pot. three times daily.

23d.—Pulse 120, rather jerky; throat less injected; less thin lymph on tonsils, but some of a yellow colour on under and back part of soft palate. Throat touched with caustic. Iod. pot. four times daily.

24th.—Pulse 96; yellow lymph on back of uvula; voice rather husky. Touched lymph, sponged fauces, and dropped solution into larynx. Iod. pot. every fifth hour.

25th.—Pulse 98, soft; inflammation of throat and huskiness less. Touched, etc., as yesterday.

26th.—Pulse 104, soft; nares very red; huskiness gone; throat free from inflammation, and looks now only relaxed, with tonsils slightly swollen, and a very little watery-looking lymph adhering. Treatment as before.

27th.—Pulse 90; throat clean, and free from inflammation. Convalescent, though still weak.

This case was of a decided and pretty severe character, but, throughout, it seemed to me that I had a complete control over the symptoms as they occurred. The following case was still more severe:—

On the evening of 25th February, Mr F. brought his son, five years old, to my house. I found he had been complaining during the day, and was rather feverish. The throat was very much inflamed, the tonsils very much swollen, and the papillæ of the tongue very red and prominent. I sponged the throat, gave the sol. iod. pot. to be taken every five hours, and ordered the boy home immediately. I saw him again in three hours, found him very feverish, and repeated the sponging.

26th.—Restless, and very feverish during night; pulse 124, jerky; breathing thick, but not croupy, being evidently from the throat; tonsils very much enlarged and inflamed, and lymph came up after sponging. Touched with caustic and sponged. Cont. iod. pot. u. a. *Evening*.—Pulse 120, softer, but the breathing from enlarged tonsils very alarming, especially when the child is

asleep. Touched; sponged; incised tonsils in three places. Cont. iod. pot. u. a.

27th.—His father in his anxiety administered during the night an antimonial emetic, as I had said if he became croupy this should be given. Pulse 120, softer; breathing quite quiet; tonsils wonderfully improved, his mother remarking when she saw them that they were diminished one-half in size since last night; inflamed appearance of throat also much less. Touched and sponged. Cont. iod. pot. every three hours.

28th.—Wonderfully better; breathing easy; pulse 88, soft; throat clean and nearly free from inflammation, though tonsils still a little swollen; nearly convalescent. Touched and sponged throat. Cont. iod. pot. u. a.

28th.—All but well; sponged; to continue iodide for a few days. An infant in the same family became croupy on the 27th, and two other members had inflamed throats, but all quickly recovered under the treatment mentioned.

At a later period of the epidemic, I had another case in which the tonsils were affected even more seriously.

A brother having been threatened with diphtheritic croup a few days previously, the parents fortunately at once took the alarm, and I saw this patient (W. L., three and a half years old), whose tonsils were usually abnormally large, as soon as he complained. I immediately gave an emetic, sponged the throat and glottis with the caustic solution, and ordered a dessert-spoonful of the sol. iod. pot. every third hour. Notwithstanding this active treatment was continued, on the third day the pulse was upwards of 150, the tonsils were enormously swollen, and the breathing was rough and very loud and alarming. I then incised both tonsils, making two incisions into the one and three into the other. In the evening, the relief from this was very decided, and next day the pulse was 120. On the fifth day, my report says that he had passed a restless night; pulse small (120 to 130); tonsils clean, but large on upper part of right side, and uvula elongated and interfering with respiration. Excised a portion of the right tonsil, which was so spongy that there was some difficulty in laying hold of it, and also part of the uvula, after which the breathing became comparatively quiet. Continued the other measures, dropping also, twice daily, a little of a caustic solution (two grains to the ounce of water) into the windpipe from the india-rubber tube I mentioned at the close of the first part of this article (page 12). This patient also made a rapid recovery. Wine was given here to a moderate extent.

These cases seem to me most encouraging examples of what can be done in "cutting short" one of the most dangerous complications of this disease. From what I have very often seen in scarlatina, I cannot doubt that the state of the throat presented here from the outset would, if not determinedly combated, have rapidly gone on to partial or complete sloughing of the tonsils, and probably also to

loss of life. As I shall have something to say on this point when speaking of *scarlatina anginosa*, I shall merely remark at present, that the only effectual remedy I have found in these formidable cases is incision of the tonsils, and this at an early stage. These cases altogether, especially in the redness and prominence of the papillæ, the enormous swelling of the tonsils, and the character of the pulse, reminded me more of severe cases of *scarlatina anginosa* than any I had yet seen. Even here, however, it seemed to me that the inflammation affecting the throat was more superficial than I had been accustomed to see it in *scarlatina anginosa*, and the external glands at the angles of the jaws remained unaffected. This was the more remarkable in the last case, that while it was going on (in July), a younger brother was seized in the same house with *scarlatina*, in whom these glands became most severely affected. In *scarlatina*, too, as far as I had ever observed, there was not the same tendency, as in this epidemic, to affect the windpipe, and to effuse lymph there.

In the two next cases, the croup was decided from the first, although it is quite possible the throat affection had before been insidiously stealing on without attracting attention.

On 3d March, I was called to see F. J. and P. J., brothers, the first five and the second six years old. They were both seized with croup during the night, and an emetic had immediately been given to each. In the forenoon, they were still croupy and feverish, and the throats much inflamed. The throats were sponged, and some of the caustic solution dropped into the larynx, and an emetic was given, hot salt applied externally to throat, and the solution of iodide of potassium ordered every four hours.

4th.—Both easier; sponged; hot salt and iod. pot. u. a.

5th.—From an idea that the danger was over, the solution of the iodide had not been given so regularly during the last thirty hours as I wished. This morning, F. J. worse, very feverish, and croupy cough and breathing more harsh. To have emetic; hot salt externally; sol. iod. pot. every three hours. P. J. easier; iod. pot. u. a. Sponged both.

At midday, P. J. more croupy and feverish, and pulse quick and vibrating. Emetic; hot salt. Cont. iod. pot.

In evening, both still very croupy and feverish; F. J.'s pulse 128, and vibrating; P. J.'s 100, softer. Sponged both; emetic to both; hot salt. Cont. iod. pot.

6th.—Both much easier. P. J.'s throat has now lost its inflammatory appearance. F. J.'s, however, is still much inflamed, and some pieces of lymph have been adhering to sponge. Sponged morning and evening. Iod. pot. every three hours.

7th.—Both still slightly croupy, but quite easy; sponged. Cont. iod. pot.

7th to 10th.—Treatment continued, and patients now convalescent. Another slighter case occurred in the same family

It will be observed that the practice I adopted in these two cases was, as I had before done, to strike down the inflammatory symptoms, and as quickly as possible to pour in the iodide to counteract the constitutional affection. I did not succeed in getting the latter done at first to my satisfaction; and on the 5th, both cases became more threatening. On this day, one got an emetic twice, and the other once, and there can be no doubt that their condition had become critical. From this date the treatment seemed completely to restrain the disease; and it is proper to direct attention to the circumstance, that the iodide of potassium, on the operation of which I was beginning to rely with some confidence, was now given in full doses.

I shall mention another case, which I think shows very strikingly the real efficacy of this combined treatment.

Under date April 4th, I have it noted, that "I have seen few cases except very slight ones for three weeks, until to-day, when I was called to visit one two miles north from where I had previously seen or heard of any."

The patient, S. S., was a girl three years old. Her mother stated that she had been unwell for a fortnight, and that about a week since she became slightly croupy, and had been gradually getting more so, until the parents had become very much alarmed as to the consequences. For the last week, she had been very restless and feverish occasionally. She had been attended by another practitioner for twelve days, from whom she got a purgative powder, and had had her throat touched with solid caustic five times. The harsh croupy cry of this little patient was heard ringing through the house as soon as I entered it, and the throat and fauces when examined were found inflamed, and the uvula coated with semi-transparent lymph. On the soft palate there were marks of the caustic having been recently applied.

I immediately touched the fauces with the caustic solution, and dropped some into the glottis; gave an antimonial emetic; had hot salt applied to the throat externally, and a sinapism to the neck and chest, and ordered these to be followed by a dessert-spoonful of the solution of the iodide of potassium every three hours.

April 5th.—Symptoms very much relieved. Mother stated that she slept quietly. Pulse quiet, and no fever; croupiness greatly abated; touched throat with solid caustic, and glottis and fauces with solution. To repeat hot salt and sinapism. Iod. pot. u. a. Father to sponge throat in evening.

6th.—Hardly any lymph remaining, and the inflammation of throat nearly gone, the improvement in its appearance being very remarkable; the mucus on the sponge also quite natural. Child quite easy, and the little that remained of the croupy cough loose and without harshness. Sponged u. a., and father to repeat this in the evening to throat. Iod. pot. u. a., and hot salt at night, the mother remarking that she approved much of the latter, as it put

the child into a free perspiration. There are indeed, I think, few better diaphoretics for children.

7th.—Apparently quite well now. When she cried, voice perfectly clear in expiration; in inspiration the slightest possible harshness. Throat free from inflammation, but very slightly swollen, and a little glairy transparent fluid on its surface. Sponged throat and glottis, the fluid brought up on the sponge being natural in appearance. Mother states, however, that a good deal of purulent-looking mucus was expectorated in the morning. Father to sponge in evening. Cont. iod. pot. u. a.

9th.—Easy. Mother says there is still at night a little roughness in voice, but very little indeed to-day. Iod. pot., etc., u. a.

11th.—Convalescent.

Cases such as this, which had been under the care of others before I saw them, were to me particularly valuable, as they enabled me so far to put to the test the mode of treatment I was now employing; and certainly the results here were very gratifying to me as well as to the parents. I may remark, that if there were some circumstances in the prognosis unfavourable, there were others the reverse,—the chief of them being, perhaps, that the disease at the time I got this case in charge ought naturally to have been declining; for I have observed that in other cases the fever which ushers in the attack goes off, where there are not serious local complications, in from ten to fourteen days. Keeping this in view, no one, I think, who had seen this case could nevertheless doubt, 1st, that on 4th April there was serious danger; and, 2d, that the remedies here employed rapidly removed that danger.

I have already had occasion to mention, at page 6, the case of a servant who had also been under treatment a week before I saw her. Gargles and hot applications externally had alone, I was informed, been used. The chief affection of the throat was fortunately only on the right side, but there it was more severe than in any other I have seen in this epidemic. Within two days, the improvement that took place in it, from the change of treatment, was equally as great as in the case I have just cited. I may remark, in passing, that gargles, which this girl was ordered to use, and which I see recommended in this affection by some authors, seem to me about the most inefficient remedies that can be employed; or, rather, they are not remedies at all, for they never reach the parts principally affected, and where the chief danger lies. When a gargle is used, the soft palate and tongue meet and prevent the fluid getting further than the mouth. The fauces are never touched by it, whereas it is generally the latter, including the back of the palate, the posterior part of the tonsils, and the glottis and larynx, that have chiefly to be attended to.

Many authors, I notice, hold that the inflammation in this disease *spreads* from the throat to the larynx; but I doubt whether the simple statement, that the larynx and trachea have a great tendency to be

attacked with this peculiar inflammation, would not be more safe and correct. My reasons for holding this opinion are,—1st, That from the commencement some of the cases I saw had decided croup but very little throat affection, and yet they evidently belonged to this diphtheritic epidemic; and, 2^{dly}, That we see in the exanthemata the poisons received into the system produce at once specific local inflammations. In scarlatina, for example, we see cases showing sometimes an intense, it may be a rapidly fatal, dose of the poison, without any serious throat affection; or we see intense inflammation in the throat, without almost any tendency for it to produce croup; while again, in other epidemics, we see a strong tendency for the mouth, nose, internal ear, and eyes to become affected. In different epidemics of measles, also, the same thing is noticed: one example of which that came under my observation struck me very much. Some years since, in a village in this neighbourhood, measles prevailed, and a very large proportion of those seized were also affected with croup. In a colliery, about two miles distant, the same disease was epidemic at the same time; but there I did not see a single case of croup, while a large proportion of the affected had a pneumonic complication.

From the middle of April to the end of May, I saw a number of cases in which the throats, and especially the tonsils, were inflamed, with occasional small patches of lymph on them, and with a strong tendency to affection of the larynx; and with also, in some, a tendency to run into a low and rather severe form of fever, which lasted nearly three weeks. One of the most marked and severe of this kind was a girl, J. A., æt. 10 years. The attack commenced on 20th May, like most of the others, with general inflammatory symptoms, and indications of some pulmonary congestion, but soon degenerated into something like mild typhus, with rather troublesome bowel-complaint. A well-marked crisis occurred on the seventeenth day; and during the attack, the cheeks, soft palate, and indeed the whole mouth, became covered with a soft creamy-looking lymph, which in many places could be easily scraped off as a paste, or separated as a very soft membrane. Under the use of the caustic solution and the iodide of potassium, the whole of this came off in a mass in twenty-four hours, leaving the mucous membrane red and rawish-looking, but otherwise apparently little injured. A large secretion of a tough mucus took place from the mouth and throat for some days afterwards. In the latter stages of this attack, wine was given freely, and with evident benefit. In this class of cases, I employed at the commencement, and as long as the state of the throat seemed to require it, the same local and general treatment as in the others.

In June, I saw three well-marked mild cases of diphtheria in an isolated situation in the country, in two of which the factor of the breath was very decided, even at the commencement of the attack. There were no detached pieces of putrid lymph to account for this,

and I satisfied myself that in these, and also in another case, the factor arose from an affection of the gums, similar to what we see in mercurial salivation. A few touches with the solid caustic on successive days completely removed this symptom, which, though trifling in itself, alarmed the parents much.

In June, too, I had three remarkably interesting examples of diphtheritic croup, ushering in and combined with measles. Two of these were uncommonly severe attacks,—one, among the most severe I ever saw recovered from. In it the croup preceded the measles by three days, and was well subdued before the measles appeared. The papillæ of the tongue were unusually prominent, though not nearly so red as in scarlatina, and each separate papilla seemed to be coated with lymph. In all three, the sponge, as in the others, was used freely, the weak caustic solution was dropped from the tube twice daily into the larynx, and iodide of potassium was given in full doses,—in all, it seemed to me, with the best effects.

I have mentioned all the fatal cases that, up to this date, had occurred to me from diphtheria, or the accompanying croup, in this epidemic, and I have only another to add to the list. This occurred on 14th July, there having been no death from these affections from 13th Feb. to this date among my patients. As this also is the only fatal case of this kind I have as yet had, in which the local and general remedies I had been using were employed, I hope I shall not be thought tedious in mentioning a few particulars connected with it.

I was called on 11th July to see J. A., a girl five years old, who was on a visit here from a distance, and lived close to where diphtheria had first appeared in January. I was afterwards told that she had previously been subject to pneumonic or bronchitic and croupal attacks; and she appeared to me when I first saw her to be labouring under a mild seizure of the former kind. A sinapism had already been applied, and I ordered further only a mixture containing antimonial wine and syrup of squills. I thought so lightly of the attack that I did not see her until next evening, when the croupy breathing was decided, and had been so during the day I was informed,—the friends, who had never seen a case of croup, thinking it merely bronchitis. As the pulse, though quick, was soft, I contented myself with sponging the throat (which was inflamed, but had no lymph on it) with the caustic solution, dropping the same from the tube into the larynx, and getting hot salt applied externally.

Two hours afterwards (at 10 P.M.), as the pulse had become vibrating and the breathing worse, an emetic was given, the hot salt was continued, and the sponging and dropping into the larynx repeated. At midnight, these were again repeated, and a dessert-spoonful of the sol. iod. pot. ordered every second hour, the pulse being softer and the cough looser.

July 13th.—9 A.M. Has been very distressed during the night; pulse 129, small and jerky; breathing very loud, and much mucus gurgling in windpipe, some which I saw being quite purulent; throat inflamed, and uvula completely coated with lymph. Sponging, etc., u. a.

Noon.—Says she feels somewhat easier; is in a profuse perspiration; pulse 120, slightly jerky; breathing still very croupy, but does not seem distressed. Sponged, etc., u. a.

Midnight.—Have seen her at six o'clock, eight, and now; each time repeating

the sponging, etc. The uvula having become much elongated, I excised a portion of it; and at 8 P.M., the pulse having become strong and vibrating, an emetic was again given, and a sinapism was applied to the chest. Croupy breathing has been intense, and distress great. Nevertheless, has slept two hours, and seems now a little easier. To have a tablespoonful of the sol. iod. pot. every two hours.

On the morning of the 14th, as the breathing was getting worse, and the strength was beginning to fail, a telegram was sent for Professor Miller, with the view to his performing tracheotomy; but even before this could be transmitted, she expired.

On the 16th, I examined the body. A quantity of very yellow pus had escaped from the mouth, and, on looking into the latter, the cavity formed by the hard palate was also found completely filled with the same. I first opened the trachea from before, *in situ*, when a yellow semi-fluid lining of lymph protruded. I then removed the parts, and found that this lining of lymph extended from the top of the epiglottis to the bronchial bifurcation, gradually becoming less as it descended, both in thickness and in consistence. Even at the top of the larynx, however, the consistence was not greater than that of slightly-dried flour paste, and throughout it was quite easily detached from the mucous membrane. A good deal of the purulent-looking fluid already mentioned was found in the larynx and trachea, and the epiglottis and surrounding parts gave evidence of pretty severe inflammation having existed there. Old pleuritic adhesions were found on the right side of the chest, and there was some inflammatory congestion of the lower portion of the left lung.

The point in this case which seems to me practically by far the most important is, the nature of the symptoms by which it was ushered in. I have no doubt now that these were diphtheritic from the first, and this disease probably existed even before the bronchitic attack on 11th July. I was called to just such another case a few weeks afterwards, in which the mother stated that the child had been unwell, though still going about, for twelve days before the croupal symptoms appeared, and in this family two other children were found to have their throats affected. Had I, on the 11th, taken the precaution to examine the throat, it is probable that its condition might have excited my suspicions (though there was no lymph on it even on the 12th), and that I might have then treated the case as I did on the following day. If I had thus gained twenty-four hours in commencing what has seemed to me in other cases the really effectual treatment, the result, I think, might have been very different.

A most valuable aid, in diagnosing these cases at an early stage, I have found to be the prominence of the papillæ of the tongue and throat. Often we see them red and prominent as in scarlatina; but very often also I have noticed them equally or more prominent and quite pale, or only very little injected; in this case giving the throat the granular look I have formerly mentioned. Whenever I now notice the papillæ thus affected, I have my suspicions aroused as to the true character of the case. Early in this affection, too, I have noticed that the tonsils occasionally present a peculiar scooped-out appearance, which we likewise sometimes see in scarlatina.

The lesson which this and the other cases I have seen have especially

impressed upon my mind is this, that, while diphtheria prevails amongst us, we must, if we wish to treat our cases successfully, examine the condition of the throat, particularly in children, much more anxiously than is usual under ordinary circumstances; and whenever there is the slightest suspicion of the existence of this disease, I would say, that it is a safe rule, at the least, to sponge the throat with the caustic solution, and to drop a little of the same into the glottis.¹

In this case, as formerly, the important question forces itself on our attention, Did the treatment, local and general, materially modify or prevent the effusion of lymph in the windpipe? On this point it may be observed, in the first place, that, to say the least, we can hardly answer this question in the negative, for the consistency and adhesion to the mucous membrane of the lymph (it barely admits of being denominated false membrane) might have been much less favourable. Indeed, as a membrane, it could hardly have been more favourable, in relation either to tracheotomy, to catheterism of the glottis, or to its spontaneous evacuation. I have mentioned just such an effusion in the mouth which, in twenty-four hours after being brought under treatment, separated and came off in a pulsatious mass. But if in the mouth, may not the same be effected in the windpipe? From the very decided character which this case had assumed even at 8 p.m. on July 12, I suspect that the effusion of lymph into the larynx had been slowly advancing, perhaps for several days. As death took place thirty-seven hours afterwards, I had therefore, on the one hand, only a short time in which to operate on the disease, while, on the other, I was denied the great advantage which this epidemic has for the most part afforded me, of applying my local and general treatment before the laryngeal symptoms appeared. In all but trifling cases of this description which have come under my care for the six months since the middle of February, I have endeavoured to *anticipate* especially the dangers to the larynx. I have not waited till hoarseness or croup made its appearance, but have daily, once at least, sponged the glottis and got into it a few drops of the caustic solution, using at the same time the iodide of potassium and the other remedial measures mentioned. In the present instance, it will be noticed that the glottis was sponged with a strong caustic solution, and a weaker one dropped into it, eight times in the twenty-eight hours after the croup was observed. In forty-eight hours I have been accustomed latterly to see a very marked improvement on the

¹ In sponging the glottis in children, I make the attendant place the child on her knees with its feet to the right side, and hold firmly with her left hand its head to her left breast, while, with her right hand, she also holds firmly both its hands. I then depress the tongue with a teaspoon, pass the whalebone flat till it reaches the pharynx, and then turn the sponge (which is about the size of a common bean) downwards, and press it forwards on the glottis. This little manipulation, when well managed, occupies only an instant. The tube for dropping the solution into the glottis I manage in a similar way.

mouth under the same local and general treatment; and whether it has been that these have been more efficacious than formerly, or that the epidemic has become modified, I certainly have felt a great deal more confidence than I did at first in the management of my cases. Secondly, besides the lymph, there was secreted in the larynx of this little girl a large quantity of a fluid having the appearance of pus, which at last seemed to act as the immediate cause of death by producing suffocation. I have mentioned some others, and I noticed many more, in which also large quantities of a fluid secretion took place. In two of the severe cases of measles with diphtheritic croup I have referred to, enormous quantities were expectorated, but its appearance was that of tough phlegm. In the fatal case, details of which are given at page 8, large quantities of a whitish-looking muco-purulent fluid were secreted, and generally, as far as I have observed, its colour has corresponded pretty closely with that of the lymph effused, and with the intensity of the inflammation existing. Although less dangerous than the effusion of lymph, the secretion of even a tenacious fluid in the larynx, when the strength has begun to fail, becomes a matter of serious moment.

In July and August, I saw a good number of cases occurring over a more extended district than at first, and I noticed that the diphtheritic poison seemed to combine with measles, whooping-cough, and also, I think, with scarlatina. One of the last-mentioned kind had the slightest possible rash, and would have been, under ordinary circumstances, a case of scarlatina simplex, but in this instance the throat affection was severe.

In September, I had a case of intense diphtheritic croup in a child three years old, which I subdued by the same means as I have already mentioned. The caustic solution dropped from the tube seemed to me especially beneficial. An emetic was given five hours after the commencement of the attack, but twelve had elapsed before the caustic solution was dropped into the larynx.¹

¹ The above was written while I was correcting the printer's proof. The subsequent history of this case, as far as it has gone, seems to me of such extreme interest that I cannot refrain from adding a few details.

After the first attack had been subdued, from some misunderstanding, the solution of the iod. pot. was omitted for twenty-four hours, and a severe relapse occurred. On the morning of the 17th Sept., the case seemed desperate; nevertheless, I persevered with the iod. pot. and the sponging, but I did not venture to drop the caustic solution from the tube. In the evening, dissolution seemed impending; the larynx was filled, as in the two other cases of which I have given accounts of the dissections, with gurgling pus, while the child was unable to make the effort necessary to cough or to expectorate it. Under these circumstances, while sitting by the child, I recollected what I had noticed in examining the body of J. A. (page 23), that a great quantity of the purulent fluid had run out of, and was also found in, the mouth after death; and I asked myself what was there to prevent us in effecting the same during life? Accordingly, I had my little patient (patient in every sense of the word)

On the whole, it will be seen from what I have said, that the diphtheritic cases I have been treating have been mostly of the sthenic type when severe, some commencing with an inflammatory febrile state, while others had little of this at first; and that the chief danger has arisen from the larynx becoming the seat of inflammatory effusions. With the experience I have acquired, I still rely most upon the use of antimonial emetics for subduing the inflammatory symptoms, followed immediately by the iodide of potassium; and, for subduing the laryngeal symptoms, on the local use of the caustic solution, with the sponge and tube. The latter I have now used very frequently, and I think it will be found quite a safe means of introducing such solutions in the early stages of these affections. In the advanced stages, caution in doing so, I have no doubt, will be required. Generally, I have used a weak solution, but when the case has been urgent, I have found a small quantity of a strong solution may be used with safety at the commencement.

How far the iodide of potassium really possesses the power I have ventured to ascribe to it in diphtheria, practitioners apparently have ample opportunities of determining for themselves, as I notice that the Registrar-General states, that last year no less than 285 deaths took place from this disease, and 626 from croup (a large proportion of which, he very properly remarks, was probably diphtheritic), in the eight principal towns of Scotland. I gave this medicine in 74 cases, and of these only one died, though some of them seemed to me very severe; but I am too

tilted up, and kept for some little time with his head inclining downwards, and was gratified to find that by this means a considerable amount of pus could be got rid of, part of which was swallowed, and part was brought up on the sponge, along with portions of soft lymph of the colour and consistence of butter. I also several times during the evening introduced into the glottis, and passed well into the trachea, in imitation of Dr Green's practice, a very thin piece of whalebone, with a bit of sponge half the size of a split pea attached to it, with the intention of breaking up the soft lymph. When I left, the child was greatly relieved, and I directed that he should be placed with his head in a slightly dependent position, and that his body should be again tilted up whenever the gurgling in the larynx should return. On the morning of 18th Sept., I found him much relieved, and able to cough freely. The iod. pot. had been given every hour, and the throat has now a blanched appearance, presenting a marked contrast with its former inflamed look. I now was able, without giving any annoyance, to drop from the tube the strong caustic solution into the glottis, and to introduce into the same the sponge on the whalebone after being saturated with the solution. I again had my patient tilted up, and got rid of a good deal of yellow pus or very soft lymph, and left him tolerably comfortable.

9 p. m.—Has lain with his head elevated for four hours, and is now more distressed. Cleaned out glottis as before, and placed his head a little lower than his body. Midnight.—More easy. Rept. omnia u. a.

19th Sept.—Considerably easier; a good deal of soft yellow lymph is being coughed up, and comes away on the sponge. Rept. omnia u. a. Evening.—Still easy.

20th Sept.—Going on favourably.

well aware of the many fallacies that may enter into any such statistical statement, to do more than ask to be allowed to say, that my impression of the benefits to be derived from it, in conjunction with the other remedies employed, is very favourable.¹

From a return I have obtained from the Registrar here, I find that during the first seven months of 1862, the whole deaths in the burgh and parish of Falkirk were 251, of which 1 in 42 is reported as diphtheria or croup; while in the same period of 1863 the deaths have been 226, of which 1 in 9 is reported as diphtheria or croup.

I should have liked much to have tried the comparative efficacy in this disease of some of the other remedies, local and constitutional, which have been recommended by various writers; but as the treatment I was employing seemed to be successful, I thought it best, in the meantime, to give it as full a trial as circumstances permitted me to do.

Since the occurrence of the very interesting scarlatina epidemic which prevailed in Edinburgh in 1833, which was the first I saw, and of which I gave a short account in the *Edinburgh Medical Journal* for that year, I have seen a number of others in Falkirk, and have particularly noted the variations in the intensity and extent to which the throat and the adjacent parts have been affected. As these are of great practical importance in themselves, and as diphtheria, in different epidemics, seems to undergo like modifications, I shall here notice a few of them. In the Edinburgh epidemic I have referred to, I saw about 300 cases, which were mostly of the sthenic type. In the secondary dropsical affection, which was very frequent, I saw some of the most severe and rapid pneumonias I have met with in practice. The throat affection was very often of the same highly inflammatory type, affecting chiefly the tonsils, fauces, and top of the windpipe, but not of the nature of croup. The lungs also were occasionally affected. Lymph was generally found effused over the tonsilar openings, and in neglected cases the whole tonsils became a sloughing mass. I think I noticed, that this intense inflammation and enormous enlargement of the tonsils seemed even to increase in the epidemics I saw for several years afterwards. I have seen the tonsils almost close the faucial passage. Very often their size was such as literally to prevent the caustic being passed when I wished to touch the posterior portions. I used the caustic freely, and when I got the case early I could keep the surface clean. After a time I found the treatment by incision, which I have already referred to, by far the most effectual, and this plan I have now pursued for many years. The pathology in these cases seems to me somewhat similar to that of carbuncle,

¹ After the first part of this paper had been published, I received, through the kindness of Dr Wade, Birmingham, his "Notes on Clinical Medicine," in which I notice he states that he also had employed with success iodide of potassium conjoined with chlorate of potass.

and this treatment, if adopted early, is equally satisfactory in both. I generally make one, two, or three incisions on each side, according to the mass to be dealt with. Twelve or fifteen years since, I saw pretty frequently a modification of this throat affection. The tonsils did not alone project inwards, but the descending pillars of the soft palate were also projected inwards like perpendicular walls, so as nearly or altogether to touch the uvula. Here, likewise, one or two incisions acted most beneficially. I have seen very little of either of these affections of the throat for several years. In those cases which occurred in the earlier years of my practice, the lymph was effused mostly in the neighbourhood of the tonsils, and, except when such sloughing as I have mentioned took place, no ulceration was to be seen. Some years subsequently, however, in one epidemic, I saw the tongue, cheeks, lips, and even the nose pretty severely affected in this way. There was first a thick, very adherent lymph effused, and when this separated, the raw patches, though not deep, were numerous enough. The local treatment I have uniformly pursued in these cases has been the same as that I adopted in diphtheria, and I think generally with great success, if the case came under my care early; not but that, it must be admitted, there will be a considerable mortality in severe epidemics from a variety of other causes, however well the throat may be attended to. The *earliest* possible attention to it, I think, is as important in scarlatina as in diphtheria; and I formerly drew attention to the fact, that in families where scarlatina prevails its approach may be often detected, from the inflamed appearance of the tonsils, a good many hours before the rash or any threatening symptoms have shown themselves.¹ When we are thus fortunate enough to detect the approach of the enemy, not a moment should be lost in applying the caustic solution.

The affection of the glands and cellular tissue at the angles of the jaw and under the chin, and of the cellular tissue of the neck, varies as much in different scarlatina epidemics as it seems to do in diphtheria. With two trifling exceptions, I have seen none of the latter disease where the glands were in the least affected, and yet these are reported to have been seriously involved in some epidemics. Some writers have imagined that the application of the caustic to the throat was a cause of this complication; but, had it been so, I certainly ought to have seen it occur oftener, from the constancy with which I applied this remedy. The tendency to become affected seems to me rather to arise in both diseases from some peculiar and specific quality possessed by the different poisons in each epidemic and case. In the Edinburgh scarlatina epidemic of 1833, as well as in several others I have seen since, the affection of the glands and cellular tissue referred to was most serious. The whole parts became solidified into a mass or masses so consistent that, after death, in cutting

¹ See Edinburgh Medical Journal for 1837.

through them, it seemed as if the knife was dividing a piece of soft cartilage. I recollect, in afterwards talking with Professor Alison on this subject, that he spoke of some of these cases as having been among the most formidable and hopeless he had ever met with. The immediate effect of this solidification when excessive in extent, or when affecting both angles of the jaws, or these and the parts under the chin simultaneously or in succession, is to cause pressure on the glottis, which alone is often fatal or most distressing. Should the patient survive this stage, inevitable sloughing of much of the parts involved takes place, often of a most frightful character. I have seen the whole of the superficial tissues from the jaw to the clavicle become nearly gangrenous. I noticed, in two very protracted and inveterate cases of this description, that the kidneys had become secondarily affected, and this seemed to aggravate the original affection. A very alarming occurrence in such cases sometimes takes place, viz., ulceration and bleeding from the external jugular vein. I met, a few years since, with one of rather an obstinate character. A little oozing of blood commenced from some small openings in the skin of the neck. These I enlarged and stuffed with lint in the hope of compressing the vein, but with no good effect, and a good deal of blood was lost. The friends got very much alarmed at this, and the more so from the fact that a cousin of my patient had died, I was told, a few months previously from the same cause. I now laid the parts so freely open as to show me exactly where the blood came from, and I found that the opening in the vessel was on the posterior surface of the vein. On passing a piece of lint behind the vessel the bleeding was immediately stopped. Next day, as I found the vein considerably detached from the subjacent parts, I tied it and snipped it through between two ligatures, and the case did well. The only practice which I have seen decidedly beneficial in relieving the tense indurated cellular tissue and glands at the angles of the jaws and under the chin, is free incision of the parts. I have employed this treatment for a number of years, and always with decided benefit to the tissues and relief to the breathing. I make a crucial incision through the indurated parts, which sometimes are of considerable thickness, with a sharp curved bistoury. The gaping wound immediately shows the tension that has been relieved. The only objection to this practice is that it is severe, and that the practitioner will seldom ask the consent of parents, or the latter give it, until the case is becoming desperate. It is much less severe, however, than from description it would appear to be. Where it can be done in good time, it will be found, I think, very successful in relieving this severe complication, though it would be wrong to promise that there will not still be great hazard to life in these severe cases. Should the patient recover, it will be found that the marks left by such incisions, the anticipation of which may form a strong objection to their use, are very trifling. I have a patient in whom, several years since, I had

to make at least a dozen incisions for abscesses round the neck after scarlatina, and now it requires a very narrow inspection to discover any of them. In no cases more than in such unpromising ones as I have been describing, will the practitioner find how important it is that, at every stage of the disease, his vigilance should be unceasing. If the throat has from the first been well looked after, the swelled glands and cellular tissue may be successfully treated. When both are at the same time seriously affected, there can be but little hope for the patient.

The epidemics I have seen of late years have been of a much less sthenic type than those I first met with, and the local complications less grave, though occasionally a few cases have presented themselves with these in considerable severity. Wine generally seemed to be indicated, and agreed well, even when given almost from the commencement. Latterly, I have also used the iodide of potassium in scarlatina anginosa, but my cases have as yet been too few to enable me to speak with confidence as to its effects.

